

SHORT REPORT

SYSTEMS OF ARTIFICIAL LIGHTING AT THE PHYTOTRON
OF PLANT BREEDING AND GENETIC INSTITUTE (ODESSA).

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At the Odessa Phytotron we have installed over 50 climatic chambers and cabinets made by various companies of the United States, Canada, Germany and U.S.S.R. They employ different light sources including Sylvania fluorescent lamps of various types, fluorescent lamps produced in the former Soviet Union with a special luminophore, ordinary tungsten lamps, xenon, mercury, mercury-iodide, sodium, etc. Our objective in lighting is that the intensity distribution over the wave lengths should be maximal in the photosynthetically active part of the spectrum and minimal in the IR part to avoid plant sterilization.

Phytotrons are extremely energy consuming entities, and the large part of their energy consumption falls into the lighting category in our electric bills. Therefore, we are in a constant search of the processes to reduce energy, for example, we use a mirroring polychlorovinyl film as light deflector, we create combined light sources, we have even employed movie projection lamps in combination with monochromators and attempted the use of fiber glass optics. However, the main way to increase effectiveness would be the development of new types of light sources, which would come close to the threshold of 150 to 200 lumens per watt.

Over the years we were constantly improving our systems of artificial lighting, since we had good contacts with several producers and inventors in Russia. However, with the economic crisis unfolding, our Phytotron is having a difficult time keeping the equipment updated.

However, I should point out here, that our Phytotron is the only operating plant breeding Phytotron in the territory of the former Soviet Union. We will certainly do our best to keep it running and will continue our fruitful experiments. We are open for collaboration and welcome anybody who wants to deal with us on a basis of mutual cooperation.

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MARTORVÁSÁR PHYTOTRON

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Lighting in the Martonvásár Phytotron plant growth units is as follow:

24 units - Cool white and Gro-lux fluorescent 1:1 or Cool white and incandescent lamps 3:1.

24 units - Metal halide lamps

REFERENCES

Tischner, T. (1993); Lighting for plant growth in the Martonvásár Phytotron. p. 400-407 In: Lux Europa, VII.ELC, Herior-Watt University, Edinburgh.

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